

Patent claims

1. A method for joining workpieces made from plastic, the upper workpiece, facing a laser source, consisting of a material transparent to the laser beam, and the lower workpiece consisting of a material absorbent to the laser beam, such that the mutually bordering contact surfaces for the two workpieces melt and are joined to one another under pressure during a subsequent cooling, wherein the guiding of the laser beam onto the site to be joined, and the mechanical compression of the workpieces are carried out simultaneously by a machining head (15).

2. The method as claimed in claim 1, wherein the workpieces are compressed at the point of infringement (12) of the laser beam (14) in a punctiform fashion along a line.

3. The method as claimed in claim 1, wherein the machine head is moved along the welding contour while touching the upper workpiece.

4. The method as claimed in claim 2, wherein the local plane of the machine head is determined by an IR-transparent pressure element (3, 18), preferably a rotary pressure element, and an integrated lens system (6, 8) and is set by the integrated lens system (6, 8).

5. The method as claimed in claim 2, wherein the workpieces are locally fixed in a first step at one or more defined sites with the aid of the machining head (15), and subsequently the contour for the entire joint is traveled along the second step.

6. A device for joining workpieces made from plastic, the upper workpiece, facing a laser source, consisting of a material transparent to the laser beam, and the lower workpiece consisting of a material absorbent to the laser beam, such that the mutually bordering contact surfaces for the two workpieces melt and are joined to one another under pressure during a subsequent cooling, having at least one bearing surface for the workpieces, defined by a machining head (15)

with focussing devices (2, 8) for the laser beam (14) onto the contact surface, and pressure-exerting devices (4) for compressing the workpieces (6, 7, 19).

7. The device as claimed in claim 6, wherein on the end facing the workpieces (6, 7, 19) the machining head (15) has a ball (3) or roller (18) that is transparent to the laser beam (14).

8. The device as claimed in claim 7, wherein the ball (3) or roller (18) is rotatably mounted.

9. The device as claimed in claim 8, wherein the machining head (15) has a cavity (16) into which the end of an optical fiber (1) projects for coupling in the laser beam, optical devices (2, 8) are arranged in the cavity for shaping and guiding the laser beam, and the ball (3) or roller (18) is rotatably mounted at the lower end thereof.

10. The device as claimed in claim 9, wherein a thermometer (11) can be coupled into the cavity (16).

11. The device as claimed in claim 6, wherein the machining head (15) is resilient in the longitudinal direction.